

# **EXHIBIT 10**

**Amendment in Response to  
November 3, 2008 Office Action**

Submitted: May 4, 2009

**Serial No. 10/821,726**

Filed: April 8, 2004

Applicants: Michael Wayne Graham et al.

United States Court of Appeals,  
Federal Circuit.

In re Dirk M. BROUWER and Elizabeth M. Van De  
Vondervoort.  
No. 92-1225.

Feb. 8, 1996.

Applicant appealed from reconsideration decision of the Patent and Trademark Office (PTO) Board of Patent Appeals and Interferences, affirming patent examiner's rejection of claim in application relating to process of preparing certain resins. The Court of Appeals held that claimed process of reacting cross-linked resin with ester of alkenesulfonic acid to make a new sulfoalkylated resin catalyst was not prima facie obvious, although prior art taught generic chemical reaction of compound containing active methylene group with ester of vinylsulfonic acid.

Reversed.

West Headnotes

[1] Patents 291 ⚡16(1)

291 Patents

291II Patentability

291II(A) Invention; Obviousness

291k16 Invention and Obviousness in General

291k16(1) k. In General. Most Cited Cases

Obviousness inquiry is highly fact specific by design; this is so whether invention be process for making or process for using, or some other process. 35 U.S.C.A. § 103.

[2] Patents 291 ⚡108

291 Patents

291IV Applications and Proceedings Thereon

291k108 k. Rejection of Application and Notification Thereof. Most Cited Cases

When references cited by patent examiner fail to estab-

lish prima facie case of obviousness, rejection is improper and will be overturned. 35 U.S.C.A. § 103.

[3] Patents 291 ⚡16.4

291 Patents

291II Patentability

291II(A) Invention; Obviousness

291k16.4 k. Results and Means of Producing.

Most Cited Cases

Claimed process of reacting cross-linked resin with ester of alkenesulfonic acid to make a new sulfoalkylated resin catalyst was not prima facie obvious, although prior art taught generic chemical reaction of compound containing active methylene group with ester of vinylsulfonic acid; mere possibility that one of the compounds disclosed in prior art could be modified or replaced such that its use would lead to specific sulfoalkylated resin recited in claim did not make process recited in claim obvious unless prior art suggested desirability of such modification or replacement. 35 U.S.C.A. § 103.

[4] Patents 291 ⚡16.4

291 Patents

291II Patentability

291II(A) Invention; Obviousness

291k16.4 k. Results and Means of Producing.

Most Cited Cases

When any applicant properly presents and argues suitable method claims, they should be examined for obviousness in light of all relevant factors, free of any presumed controlling effect of *Durden* or any other precedent. 35 U.S.C.A. § 103.

Patents 291 ⚡328(2)

291 Patents

291XIII Decisions on the Validity, Construction, and Infringement of Particular Patents

291k328 Patents Enumerated

291k328(2) k. Original Utility. Most Cited

Cases

4,728,695. Valid.

\*423 M.P. Haddican, Shell Oil Company, Houston, Texas, argued for appellant. With him on the brief was Dean F. Vance.

Fred E. McKelvey, Solicitor, Office of the Solicitor, Arlington, Virginia, argued for appellee. With him on the brief were Richard E. Schafer, Teddy S. Gron, Associate Solicitors and Joseph G. Piccolo, Assistant Solicitor. Of counsel were Harris A. Pitlick, John W. Dewhirst and Lee E. Barrett.

Before ARCHER, Chief Judge,<sup>FN\*</sup> MICHEL, Circuit Judge, and CARRIGAN, District Judge.<sup>FN\*\*</sup>

FN\* Judge Archer assumed the position of Chief Judge on March 18, 1994.

FN\*\* Honorable James R. Carrigan, United States District Court for the District of Colorado, sitting by designation. Judge Carrigan retired from the federal judiciary effective August 19, 1995, and thus took no part in the disposition of this appeal.

# PER CURIAM.

This appeal is from the December 9, 1991, reconsideration decision of the United States Patent and Trademark Office (PTO) Board of Patent Appeals and Interferences (Board), Appeal No. 90-1349. That decision adhered to the Board's March 18, 1991, decision affirming the examiner's rejection of claims 8 through 27 of Brouwer and Van De Vondervoort's (collectively Brouwer) application serial no. 98,154, a division of application serial no. 831,398, filed February 20, 1986, now U.S. Patent No. 4,728,695 (crosslinked resins containing thermally stable sulfonic acid groups). The real party in interest is Shell Oil Company, the assignee of any pat-

ent issuing from the application.

The rejection of the above claims was predicated solely on obviousness, per 35 U.S.C. § 103, in view of the combined teaching of two references.<sup>FN1</sup> Because, under the legally correct method for determining obviousness, the claimed process was not *prima facie* obvious in view of the cited prior art references, we reverse.

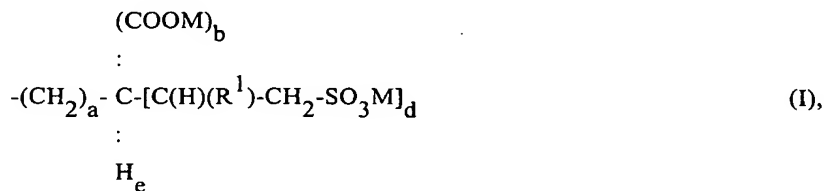
FN1. The references are as follows: Distler, *The Chemistry of Vinylsulfonic Acid* [1], 4 Angew. Chem. Int'l Ed. 300 (1965); and Morrison & Boyd, *Organic Chemistry* 1179-1181 (4th ed. 1983).

## *The Invention*

Brouwer's application is directed to a process for preparing sulfoalkylated polystyrenedivinylbenzene resins. Claim 8, the principal claim on appeal,<sup>FN2</sup> is as follows:

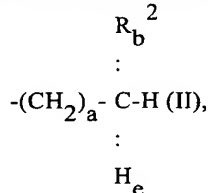
FN2. Because Brouwer did not argue the separate patentability of claims 8 through 27 before the Board, all the claims stand (or fall) together. *In re Dillon*, 919 F.2d 688, 692, 16 USPQ2d 1897, 1900 (Fed.Cir.1990) (in banc), *cert. denied*, 500 U.S. 904, 111 S.Ct. 1682, 114 L.Ed.2d 77 (1991); *In re Kroegel*, 803 F.2d 705, 709, 231 USPQ 640, 642-43 (Fed.Cir.1986).

8. A process for the preparation of a catalyst comprising an aryl group having a functional substituent group of general formula

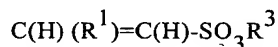


wherein a is 0 or 1, b is 1 or 2, d is 1 or 2, e is 0 or 1, b+d+e=3, R<sup>1</sup> represents H or a C1 to C4 alkyl group and M is a proton or another cation; which process comprises the steps of

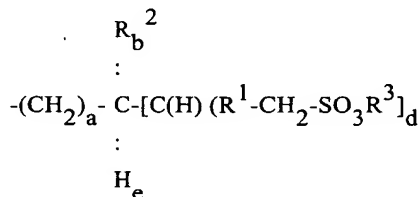
a) reacting (1) a crosslinked resin comprising at least



\*424 wherein a, b, and e have the same meaning as in general formula (I), b+e=2, R<sup>2</sup> is a -CN or a carboxyester group and if b is 2, each R<sup>2</sup> represents a -CN or a carboxyester group, and



wherein R<sup>1</sup> has the same meaning as in general formula (I), and R<sup>3</sup> is a hydrocarbyl group, under conditions suitable for the formation of an addition product



wherein a, b, d, e and R<sup>1</sup> have the same meaning as in general formula (I), b+d+e=3, R<sup>2</sup> has the same meaning as in general formula (II) and R<sup>3</sup> has the same meaning as in general formula (III), and then

(b) hydrolyzing the addition product of general formula (IV) to produce a compound having a functional group of general formula (I).

Brouwer's U.S. Patent No. 4,728,695 covers the sulfoalkylated resins resulting from the process recited in claim 8. In other words, viewed as of the time the claimed process was invented, claim 8 recites a process of reacting a crosslinked resin with an ester of an alkenesulfonic acid to make a new, nonobvious sulfoalkylated resin catalyst.

one substituted aryl group having a functional substituent group of general formula

(2) an ester of an alkenesulfonic acid of general formula

(III),

of general formula

(IV),

alkylated resin catalyst. The '695 patent, like the application at bar, claims priority to the February 1986 parent application.

#### *The Rejection*

[1] The examiner rejected claims 8 through 27 in light of the combined teaching of the two references noted above. As Brouwer acknowledges, Distler teaches so-called "Michael addition" reactions <sup>FN3</sup> in which a vinylsulfonate is reacted with an active methylene group-containing compound. Distler, however, neither discloses nor suggests making a catalyst by reacting an ester of an alkenesulfonic acid with a crosslinked resin; instead, Distler discloses simple, well-defined com-

pounds the derivatives of which would not be expected to exhibit the catalytic activity and thermal stability of the sulfoalkylated resin made according to the process of claim 8. Specifically, the crosslinked resin recited in claim 8, unlike the Distler compound having an active methylene group, has an aryl-pendant -CN or carboxyester functional group. Morrison & Boyd's *Organic Chemistry* broadly discloses Michael addition reactions with two simple hydrocarbons; like Distler, it neither discloses nor suggests reacting an ester of an alkenesulfonic acid with a crosslinked resin. The examiner explained his initial rejections thusly:

FN3. *Michael addition*, named after chemist Arthur Michael (1854-1942), is a standard technique in organic chemistry for reacting a material having an <<alpha>>, <<beta>>-unsaturated carbonyl group with a material having an active methylene group.

Process of preparing polymer by using a unsaturated compound with active methylene substrate is well known as shown by Distler or Organic Chem. Applicants' methylene unit (III) possess[es] the characteristics required to carry out reactions of the Michael-type reactions. In re Durden, [763 F.2d 1406] 226 USPQ 359 [ (Fed.Cir.1985) ].

Importantly, the examiner discussed no references containing any suggestion or motivation either (a) to use a resin-substituted methylene reactant in the generic addition reaction taught by the cited references, or (b) to obtain the specific sulfoalkylated resin catalyst made according to the process of claim 8. The examiner offered this same explanation, virtually verbatim, in both his final rejection and his answer to Brouwer's appeal to the Board.

On appeal, the Board affirmed the examiner's rejection. According to the Board,

The basic difference between the claimed Michael addition reaction and reaction "(n)" disclosed on page 304 of Distler is that the latter's methylene reactant is not attached to a resin as called for by the claims. Thus, the examiner considers that although Distler does not

disclose the \*425 claimed methylene reactant attached to a resin, one skilled in the art would have expected that reacting the same with vinylsulfonic acid would result in the claimed Michael adduct.... [O]ne desiring to make a sulfoalkylated resin would have found it obvious to do so via a Michael addition reaction such as reaction "(n)" of Distler by selecting a resin substituted methylene reactant.

In other words, the Board concluded that one desiring to make the nonobvious resin resulting from the process recited in claim 8 would know, on the basis of Distler, how to make it. The Board adhered to its decision on reconsideration.

Brouwer appeals, contending that both the examiner and the Board failed to apply the proper test for obviousness established by *Graham v. John Deere Co.*, 383 U.S. 1, 86 S.Ct. 684, 15 L.Ed.2d 545, 148 USPQ 459 (1966), and its progeny. According to Brouwer, both the examiner and the Board, persuaded that our decision in *In re Durden*, 763 F.2d 1406, 226 USPQ 359 (Fed.Cir.1985), controlled the outcome of the instant case, failed to weigh the specific differences between the claimed invention-with *all* its limitations-and the prior art references, the so-called "second *Graham* factor." See *Graham*, 383 U.S. at 17, 86 S.Ct. at 693-94 ("Under § 103 ... differences between the prior art and the claims at issue are to be ascertained [.]"). Specifically, Brouwer contends that the Board erred by treating its disclosure-namely, the sulfoalkylated resin made according to the process recited in claim 8-as prior art, leading it to affirm the examiner's rejection despite the lack of citation to any reference containing a suggestion or motivation either (a) to use a resin-substituted methylene reactant in a generic Michael addition reaction, or (b) to obtain the specific sulfoalkylated resin catalyst made according to the process recited in claim 8. We agree.

#### *The Analysis*

[2][3] The test of obviousness *vel non* is statutory. It requires that one compare the claim's "subject matter as a whole" with the prior art "to which said subject matter pertains." 35 U.S.C. § 103. The inquiry is thus highly

fact-specific by design. This is so “whether the invention be a process for making or a process of using, or some other process.” *In re Kuehl*, 475 F.2d 658, 665, 177 USPQ 250, 255 (CCPA 1973). When the references cited by the examiner fail to establish a *prima facie* case of obviousness, the rejection is improper and will be overturned. *In re Fine*, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed.Cir.1988).

[4] Applying this statutory test to the art of record, we conclude that Brouwer's process invention was not *prima facie* obvious. Although the prior art references the examiner cited teach a generic chemical reaction of a compound containing an active methylene group with an ester of vinylsulfonic acid, we have made clear that “[t]he mere fact that a device or process utilizes a known scientific principle does not alone make that device or process obvious.” *Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 1053, 5 USPQ2d 1434, 1440 (Fed.Cir.1988). *See also Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1462, 221 USPQ 481, 489 (Fed.Cir.1984) (same). Moreover, the mere possibility that one of the esters or the active methylene group-containing compounds disclosed in Distler could be modified or replaced such that its use would lead to the specific sulfoalkylated resin recited in claim 8 does not make the process recited in claim 8 obvious “unless the prior art suggested the desirability of [such a] modification” or replacement. *In re Gordon*, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed.Cir.1984). Without first knowing Brouwer's claimed process steps or the composition resulting from those steps, there is simply no suggestion in the references cited by the examiner to practice the claimed process. It was therefore not *prima facie* obvious.

The examiner erred by resting his *prima facie* case of obviousness on the purportedly controlling nature of our decision in *Durden* rather than on particularized findings, required by *Graham*, 383 U.S. at 17, 86 S.Ct. \*426 at 693-94, regarding a set of one or more references that would make the claimed process obvious, an error the Board failed to correct. As we clearly indicated in *In re Dillon*, a recent in banc decision, “[w]hen any applicant

properly presents and argues suitable method claims, they should be examined in light of all ... relevant factors, free from any presumed controlling effect of *Durden* ” or any other precedent. 919 F.2d 688, 695, 16 USPQ2d 1897, 1903 (Fed.Cir.1990) (in banc), *cert. denied*, 500 U.S. 904, 111 S.Ct. 1682, 114 L.Ed.2d 77 (1991). *See also In re Ochiai*, 71 F.3d 1565, 1570, 37 USPQ2d 1127, 1132 (Fed.Cir.1995) (“[T]here are not ‘*Durden* obviousness rejections’ or ‘*Albertson* obviousness rejections,’ but rather only section 103 obviousness rejections.”). Having compared Brouwer's claims to the prior art of record, we reverse the rejection of claims 8 through 27 as an incorrect conclusion reached by incorrect methodology.

REVERSED.

C.A.Fed., 1996.  
*In re Brouwer*  
77 F.3d 422

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